

**WHAT IS CLAIMED IS:**

1. A composition for durable non-permanent shaping or durable retention of a non-permanent shape of least one keratinous fiber comprising:

- (a) at least one film forming agent; and
- (b) at least one compound chosen from C<sub>3</sub> to C<sub>5</sub> monosaccharides,

wherein said at least one film forming agent and said at least one compound are present in an amount effective to impart a durable non-permanent shape to said at least one keratinous fiber or to durably retain a non-permanent shape of said at least one keratinous fiber.

2. A composition according to claim 1, wherein said at least one film forming agent is chosen from film forming polymers and film forming resins.

3. A composition according to claim 2, wherein said film forming polymers are chosen from cationic polymers.

4. A composition according to claim 3, wherein said cationic polymers are chosen from polyquaternium-16, polyquaternium-46 and polyquaternium-44.

5. A composition according to claim 2, wherein said film forming polymers are chosen from nonionic polymers.

6. A composition according to claim 5, wherein said nonionic polymers are chosen from:

- (i) polymers derived from (1) corn starch and (2) polyvinylpyrrolidone; and
- (ii) copolymers derived from (1) vinyl acetate and (2) vinylpyrrolidone.

7. A composition according to claim 2, wherein said film forming polymers are chosen from anionic polymers.

8. A composition according to claim 7, wherein said anionic polymers are chosen from:

- (i) polymers derived from (1) vinyl acetate, (2) crotonic acid and (3) vinyl neodecanoate;
- (ii) polymers derived from (1) acrylic acid, (2) acrylates, (3) hydroxyacrylates and (4) succinic acid; and
- (iii) polymers derived from at least two different monomers each chosen from acrylic acid, methacrylic acid, esters of acrylic acid, and esters of methacrylic acid.

9. A composition according to claim 2, wherein said anionic polymers are neutralized.

10. A composition according to claim 1, wherein said at least one film forming agent is present in said composition in an amount ranging from 0.01% to 30% by weight relative to the total weight of the composition.

11. A composition according to claim 10, wherein said at least one film forming agent is present in said composition in an amount ranging from 0.1% to 10% by weight relative to the total weight of the composition.

12. A composition according to claim 1, wherein said  $C_3$  to  $C_5$  monosaccharides are chosen from pentoses.

13. A composition according to claim 12, wherein said pentoses are chosen from aldopentoses and ketopentoses.

14. A composition according to claim 13, wherein said aldopentoses are chosen from xylose, arabinose, lyxose, and ribose.

15. A composition according to claim 13, wherein said ketopentoses are chosen from ribulose and xylulose.

16. A composition according to claim 1, wherein said  $C_3$  to  $C_5$  monosaccharides are chosen from tetroses.

17. A composition according to claim 16, wherein said tetroses are chosen from aldotetroses and ketotetroses.

18. A composition according to claim 17, wherein said aldotetroses are chosen from erythrose and treose.

19. A composition according to claim 17, wherein said tetroses are chosen from erythrulose.

20. A composition according to claim 1, wherein said  $C_3$  to  $C_5$  monosaccharides are chosen from trioses.

21. A composition according to claim 20, wherein said trioses are chosen from aldotrioses and ketotrioses.

22. A composition according to claim 21, wherein said trioses are chosen from glyceraldehyde.

23. A composition according to claim 21, wherein said trioses are chosen from dihydroxyacetone.

24. A composition according to claim 1, wherein said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from furanoses and derivatives thereof.

25. A composition according to claim 1, wherein said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides.

26. A composition according to claim 25, wherein said derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from imine derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides, hemiacetal derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides, hemiketal derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides, and oxidized derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides.

27. A composition according to claim 25, wherein said derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from oligosaccharides derived from C<sub>3</sub> to C<sub>5</sub> monosaccharides.

28. A composition according to claim 27, wherein said oligosaccharides derived from C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from xylobiose.

29. A composition according to claim 1, wherein said at least one compound is present in said composition in an amount ranging from 0.01% to 10% by weight relative to the total weight of the composition.

30. A composition according to claim 29, wherein said at least one compound is present in said composition in an amount ranging from 0.1% to 5% by weight relative to the total weight of the composition.

31. A composition according to claim 1, wherein said composition further comprises at least one additional sugar different from said at least one compound chosen from C<sub>3</sub> to C<sub>5</sub> monosaccharides.

32. A composition according to claim 31, wherein said at least one additional sugar is chosen from monosaccharides, oligosaccharides and polysaccharides.

33. A composition according to claim 32, wherein said monosaccharides are chosen from hexoses.

34. A composition according to claim 33, wherein said hexoses are chosen from allose, altrose, glucose, mannose, gulose, idose, galactose, talose, sorbose, psicose, fructose, and tagatose.

35. A composition according to claim 31, wherein said at least one additional sugar is present in said composition in an amount ranging from 0.01% to 10% by weight relative to the total weight of the composition.

36. A composition according to claim 35, wherein said at least one additional sugar is present in said composition in an amount ranging from 0.1% to 5% by weight relative to the total weight of the composition.

37. A composition according to claim 1, wherein said composition is in the form of a liquid, oil, paste, stick, dispersion, emulsion, lotion, gel, or cream.

38. A composition according to claim 1, wherein said at least one keratinous fiber is hair.

39. A composition according to claim 1, further comprising at least one suitable additive chosen from anionic surfactants, cationic surfactants, nonionic surfactants, amphoteric surfactants, fragrances, penetrating agents, antioxidants, sequestering agents, opacifying agents, solubilizing agents, emollients, colorants,

screening agents, preserving agents, proteins, vitamins, silicones, polymers, plant oils, mineral oils, and synthetic oils.

40. A composition according to claim 1, wherein said composition is heat-activated.

41. A method for durable non-permanent shaping of at least one keratinous fiber or for durable retention of a non-permanent shape of at least one keratinous fiber comprising:

applying to said at least one keratinous fiber a composition comprising:

(a) at least one film forming agent, and

(b) at least one compound chosen from C<sub>3</sub> to C<sub>5</sub> monosaccharides; and

heating said at least one keratinous fiber,

wherein said at least one film forming agent and said at least one compound are present in an amount effective to impart a durable non-permanent shape to said at least one keratinous fiber or to durably retain a non-permanent shape of said at least one keratinous fiber, and

further wherein said composition is applied prior to said heating or during said heating.

42. A method according to claim 41, further comprising wetting said at least one keratinous fiber with water prior to said application.

43. A method according to claim 41, further comprising shampooing said at least one keratinous fiber subsequent to said heating.

44. A method according to claim 43, further comprising rinsing said at least

one keratinous fiber subsequent to said shampooing.

45. A method according to claim 41, wherein said at least one film forming agent is chosen from film forming polymers and film forming resins.

46. A method according to claim 45, wherein said film forming polymers are chosen from cationic polymers.

47. A method according to claim 46, wherein said cationic polymers are chosen from polyquaternium-16, polyquaternium-46 and polyquaternium-44.

48. A method according to claim 45, wherein said film forming polymers are chosen from nonionic polymers.

49. A method according to claim 48, wherein said nonionic polymers are chosen from:

- (i) polymers derived from (1) corn starch and (2) polyvinylpyrrolidone; and
- (ii) copolymers derived from (1) vinyl acetate and (2) vinylpyrrolidone.

50. A method according to claim 45, wherein said film forming polymers are chosen from anionic polymers.

51. A method according to claim 50, wherein said anionic polymers are chosen from:

- (i) polymers derived from (1) vinyl acetate, (2) crotonic acid and (3) vinyl neodecanoate;
- (ii) polymers derived from (1) acrylic acid, (2) acrylates, (3) hydroxyacrylates and (4) succinic acid; and
- (iii) polymers derived from at least two monomers chosen from acrylic acid,

methacrylic acid, esters of acrylic acid, and esters of methacrylic acid.

52. A method according to claim 50, wherein said anionic polymers are neutralized.

53. A method according to claim 41, wherein said at least one film forming agent is present in said composition in an amount ranging from 0.01% to 30% by weight relative to the total weight of the composition.

54. A method according to claim 53, wherein said at least one film forming agent is present in said composition in an amount ranging from 0.1% to 10% by weight relative to the total weight of the composition.

55. A method according to claim 41, wherein said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from pentoses.

56. A method according to claim 55, wherein said pentoses are chosen from aldopentoses and ketopentoses.

57. A method according to claim 56, wherein said aldopentoses are chosen from xylose, arabinose, lyxose, and ribose.

58. A method according to claim 56, wherein said ketopentoses are chosen from ribulose and xylulose.

59. A method according to claim 41, wherein said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from tetroses.

60. A method according to claim 59, wherein said tetroses are chosen from aldotetroses and ketotetroses.



61. A method according to claim 60, wherein said aldotetroses are chosen from erythrose and treose.

62. A method according to claim 60, wherein said tetroses are chosen from erythrulose.

63. A method according to claim 41, wherein said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from trioses.

64. A method according to claim 63, wherein said trioses are chosen from aldotrioses and ketotrioses.

65. A method according to claim 63, wherein said trioses are chosen from glyceraldehyde.

66. A method according to claim 63, wherein said trioses are chosen from dihydroxyacetone.

67. A method according to claim 41, wherein said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from furanoses and derivatives thereof.

68. A method according to claim 41, wherein said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides.

69. A method according to claim 68, wherein said derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from imine derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides, hemiacetal derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides, hemiketal derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides, and oxidized derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides.

70. A method according to claim 68, wherein said derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from oligosaccharides derived from said C<sub>3</sub> to C<sub>5</sub> monosaccharides.

71. A method according to claim 70, wherein said oligosaccharides derived from said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from xylobiose.

72. A method according to claim 68, wherein said derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides are substituted.

73. A method according to claim 41, wherein said at least one compound is present in said composition in an amount ranging from 0.01% to 10 % by weight relative to the total weight of the composition.

74. A method according to claim 73, wherein said at least one compound is present in said composition in an amount ranging from 0.1% to 5% by weight relative to the total weight of the composition.

75. A method according to claim 41, wherein said composition further comprises at least one additional sugar different from said at least one compound chosen from C<sub>3</sub> to C<sub>5</sub> monosaccharides.

76. A method according to claim 75, wherein said at least one additional sugar is chosen from monosaccharides, oligosaccharides and polysaccharides.

77. A method according to claim 76, wherein said monosaccharides are chosen from hexoses.

78. A method according to claim 77, wherein said hexoses are chosen

from allose, altrose, glucose, mannose, gulose, idose, galactose, talose, sorbose, psicose, fructose, and tagatose.

79. A method according to claim 75, wherein said at least one additional sugar is present in said composition in an amount ranging from 0.01% to 10% by weight relative to the total weight of the composition.

80. A method according to claim 79, wherein said at least one additional sugar is present in said composition in an amount ranging from 0.1% to 5% by weight relative to the total weight of the composition.

81. A method according to claim 41, wherein said composition is in the form of a liquid, oil, paste, stick, dispersion, emulsion, lotion, gel, or cream.

82. A method according to claim 41, wherein said at least one keratinous fiber is hair.

83. A method according to claim 41, further comprising at least one suitable additive chosen from anionic surfactants, cationic surfactants, nonionic surfactants, amphoteric surfactants, fragrances, penetrating agents, antioxidants, sequestering agents, opacifying agents, solubilizing agents, emollients, colorants, screening agents, preserving agents, proteins, vitamins, silicones, polymers, plant oils, mineral oils, and synthetic oils.

84. A method according to claim 41, wherein said composition is applied prior to and during said heating.

85. A method according to claim 41, wherein said composition imparts a

durable non-permanent shape to said at least one keratinous fiber and durably retains a non-permanent shape of said at least one keratinous fiber.

86. A method for durable non-permanent shaping of at least one keratinous fiber or for durable retention of a non-permanent shape of at least one keratinous fiber comprising:

applying to said at least one keratinous fiber a composition comprising at least one compound chosen from  $C_3$  to  $C_5$  monosaccharides; and

heating said at least one keratinous fiber,

wherein said at least one compound is present in an amount effective to impart a durable non-permanent shape to said at least one keratinous fiber or to durably retain a non-permanent shape of said at least one keratinous fiber, and

further wherein said composition is applied prior to said heating or during said heating.

87. A method according to claim 86, further comprising wetting said at least one keratinous fiber with water prior to said applying.

88. A method according to claim 86, further comprising shampooing said at least one keratinous fiber subsequent to said heating.

89. A method according to claim 88, further comprising rinsing said at least one keratinous fiber subsequent to said shampooing.

90. A method according to claim 86, wherein said  $C_3$  to  $C_5$  monosaccharides are chosen from pentoses.

91. A method according to claim 90, wherein said pentoses are chosen from aldopentoses and ketopentoses.

92. A method according to claim 91, wherein said aldopentoses are chosen from xylose, arabinose, lyxose, and ribose.

93. A method according to claim 91, wherein said ketopentoses are chosen from ribulose and xylulose.

94. A method according to claim 86, wherein said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from tetroses.

95. A method according to claim 94, wherein said tetroses are chosen from aldotetroses and ketotetroses.

96. A method according to claim 95, wherein said aldotetroses are chosen from erythrose and treose.

97. A method according to claim 94, wherein said tetroses are chosen from erythrulose.

98. A method according to claim 86, wherein said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from trioses.

99. A method according to claim 98, wherein said trioses are chosen from aldotrioses and ketotrioses.

100. A method according to claim 99, wherein said trioses are chosen from glyceraldehyde.

101. A method according to claim 99, wherein said trioses are chosen from dihydroxyacetone.

102. A method according to claim 86, wherein said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from furanoses and derivatives thereof.

103. A method according to claim 86, wherein said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides.

104. A method according to claim 103, wherein said derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from imine derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides, hemiacetal derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides, hemiketal derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides, and oxidized derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides.

105. A method according to claim 103, wherein said derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from oligosaccharides derived from said C<sub>3</sub> to C<sub>5</sub> monosaccharides.

106. A method according to claim 105, wherein said oligosaccharides derived from said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from xylobiose.

107. A method according to claim 103, wherein said derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides are substituted.

108. A method according to claim 86, wherein said at least one compound is present in said composition in an amount ranging from 0.01% to 10% by weight relative to the total weight of the composition.

109. A method according to claim 108, wherein said at least one compound is present in said composition in an amount ranging from 0.1% to 5% by weight relative to the total weight of the composition.

110. A method according to claim 86, wherein said composition further comprises at least one additional sugar different from said at least one compound chosen from C<sub>3</sub> to C<sub>5</sub> monosaccharides.

111. A method according to claim 110, wherein said at least one additional sugar is chosen from monosaccharides, oligosaccharides and polysaccharides.

112. A method according to claim 111, wherein said monosaccharides are chosen from hexoses.

113. A method according to claim 112, wherein said hexoses are chosen from allose, altrose, glucose, mannose, gulose, idose, galactose, talose, sorbose, psicose, fructose, and tagatose.

114. A method according to claim 110, wherein said at least one additional sugar is present in said composition in an amount ranging from 0.01% to 10% by weight relative to the total weight of the composition.

115. A method according to claim 114, wherein said at least one additional sugar is present in said composition in an amount ranging from 0.1% to 5% by weight relative to the total weight of the composition.

116. A method according to claim 86, wherein said composition is in the form of a liquid, oil, paste, stick, dispersion, emulsion, lotion, gel, or cream.

117. A method according to claim 86, wherein said at least one keratinous fiber is hair.

118. A method according to claim 86, further comprising at least one suitable additive chosen from anionic surfactants, cationic surfactants, nonionic surfactants,

amphoteric surfactants, fragrances, penetrating agents, antioxidants, sequestering agents, opacifying agents, solubilizing agents, emollients, colorants, screening agents, preserving agents, proteins, vitamins, silicones, polymers, plant oils, mineral oils, and synthetic oils.

119. A method according to claim 86, wherein said composition is applied prior to and during said heating.

120. A method according to claim 86, wherein said composition imparts a durable non-permanent shape to said at least one keratinous fiber and durably retains a non-permanent shape of said at least one keratinous fiber.

121. A composition for durable non-permanent shaping or durable retention of a non-permanent shape of least one keratinous fiber comprising at least one compound chosen from C<sub>3</sub> to C<sub>5</sub> monosaccharides, wherein said at least one compound is present in an amount effective to impart a durable non-permanent shape to said at least one keratinous fiber or to durably retain a non-permanent shape of said at least one keratinous fiber.

122. A composition according to claim 121, wherein said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from pentoses.

123. A composition according to claim 122, wherein said pentoses are chosen from aldopentoses and ketopentoses.

124. A composition according to claim 123, wherein said aldopentoses are chosen from xylose, arabinose, lyxose, and ribose.



125. A composition according to claim 123, wherein said ketopentoses are chosen from ribulose and xylulose.

126. A composition according to claim 121, wherein said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from tetroses.

127. A composition according to claim 126, wherein said tetroses are chosen from aldotetroses and ketotetroses.

128. A composition according to claim 127, wherein said aldotetroses are chosen from erythrose and treose.

129. A composition according to claim 127, wherein said tetroses are chosen from erythrulose.

130. A composition according to claim 121, wherein said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from trioses.

131. A composition according to claim 130, wherein said trioses are chosen from aldotrioses and ketotrioses.

132. A composition according to claim 131, wherein said trioses are chosen from glyceraldehyde.

133. A composition according to claim 131, wherein said trioses are chosen from dihydroxyacetone.

134. A composition according to claim 121, wherein said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from furanoses and derivatives thereof.

135. A composition according to claim 121, wherein said C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides.

136. A composition according to claim 135, wherein said derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from imine derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides, hemiacetal derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides, hemiketal derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides, and oxidized derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides.

137. A composition according to claim 135, wherein said derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from oligosaccharides derived from C<sub>3</sub> to C<sub>5</sub> monosaccharides.

138. A composition according to claim 137, wherein said oligosaccharides derived from C<sub>3</sub> to C<sub>5</sub> monosaccharides are chosen from xylobiose.

139. A composition according to claim 135, wherein said derivatives of C<sub>3</sub> to C<sub>5</sub> monosaccharides are substituted.

140. A composition according to claim 121, wherein said at least one compound is present in said composition in an amount ranging from 0.01% to 10% by weight relative to the total weight of the composition.

141. A composition according to claim 140, wherein said at least one compound is present in said composition in an amount ranging from 0.1% to 5% by weight relative to the total weight of the composition.

142. A composition according to claim 121, wherein said composition further comprises at least one additional sugar different from said at least one compound chosen from C<sub>3</sub> to C<sub>5</sub> monosaccharides.

143. A composition according to claim 142, wherein said at least one additional sugar is chosen from monosaccharides, oligosaccharides and polysaccharides.

144. A composition according to claim 143, wherein said monosaccharides are chosen from hexoses.

145. A composition according to claim 144, wherein said hexoses are chosen from allose, altrose, glucose, mannose, gulose, idose, galactose, talose, sorbose, psicose, fructose, and tagatose.

146. A composition according to claim 142, wherein said at least one additional sugar is present in said composition in an amount ranging from 0.01% to 10% by weight relative to the total weight of the composition.

147. A composition according to claim 146, wherein said at least one additional sugar is present in said composition in an amount ranging from 0.1% to 5% by weight relative to the total weight of the composition.

148. A composition according to claim 121, wherein said composition is in the form of a liquid, oil, paste, stick, dispersion, emulsion, lotion, gel, or cream.

149. A composition according to claim 121, wherein said at least one keratinous fiber is hair.

150. A composition according to claim 121, further comprising at least one suitable additive chosen from anionic surfactants, cationic surfactants, nonionic surfactants, amphoteric surfactants, fragrances, penetrating agents, antioxidants, sequestering agents, opacifying agents, solubilizing agents, emollients, colorants, screening agents, preserving agents, proteins, vitamins, silicones, polymers, plant oils, mineral oils, and synthetic oils.

151. A composition according to claim 121, wherein said composition is

~~heat-activated.~~

152. A kit for protecting at least one keratinous fiber from extrinsic damage or for repairing at least one keratinous fiber following extrinsic damage, said kit comprising at least one compartment,

wherein said at least one compartment comprises a composition comprising at least one compound chosen from C<sub>3</sub> to C<sub>5</sub> monosaccharides, and

wherein said at least one compound is present in an amount effective to impart a durable non-permanent shape to said at least one keratinous fiber or to durably retain a non-permanent shape of said at least one keratinous fiber.

153. A kit according to claim 152, wherein said composition further comprises at least one additional sugar, different from said at least one compound.

154. A kit according to claim 152, wherein said composition further comprises at least one film forming agent.

155. A kit according to claim 152, further comprising a second compartment comprising a composition comprising at least one film forming agent.

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